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(54) **RACK SYSTEM HAVING ELECTRICAL SUPPLY**

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*A47F 11/10* (2006.01)

(52) **U.S. Cl.**
CPC ..... ***A47F 5/0043*** (2013.01); *A47F 5/0081* (2013.01); *A47F 11/10* (2013.01)

(58) **Field of Classification Search**
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USPC ..... 174/99 B
See application file for complete search history.

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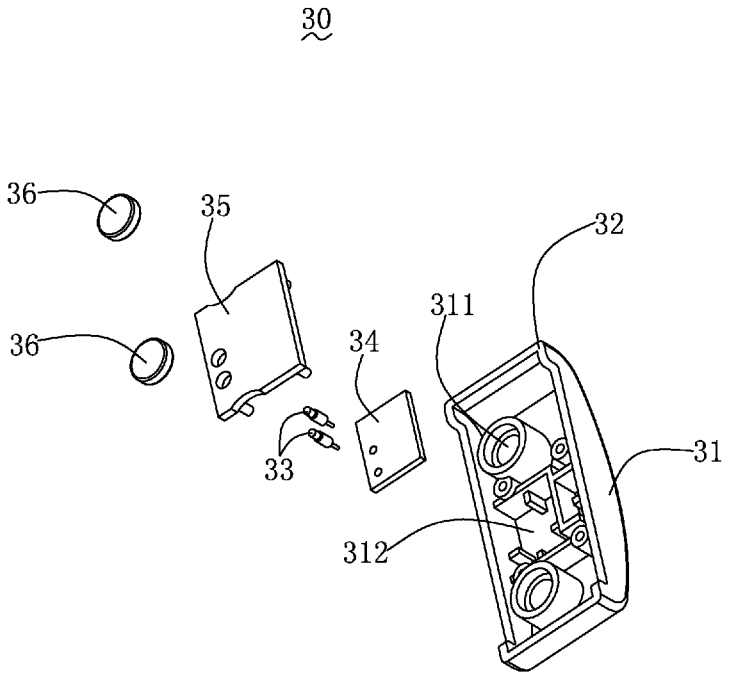
(57) **ABSTRACT**

A rack system having an electrical supply includes at least one backboard, a bus bar mounted on one of the backboard, and at least one supplier arranged on the bus bar. The bus bar includes a track body, two magnetic strips provided on the track body, and two current conductors spaced apart and disposed on the track body. The magnetic strip receiving grooves and the conductor receiving grooves being arranged two side walls of the track body respectively in a cross section perpendicular to the extending direction of the track body. The supplier includes two resilient contactors spaced apart from each other, and two magnetic columns arranged both sides of the resilient contactors respectively. When the supplier is mounted on the bus bar, the two resilient contactors are electrically connected to the current conductor.

**14 Claims, 4 Drawing Sheets**



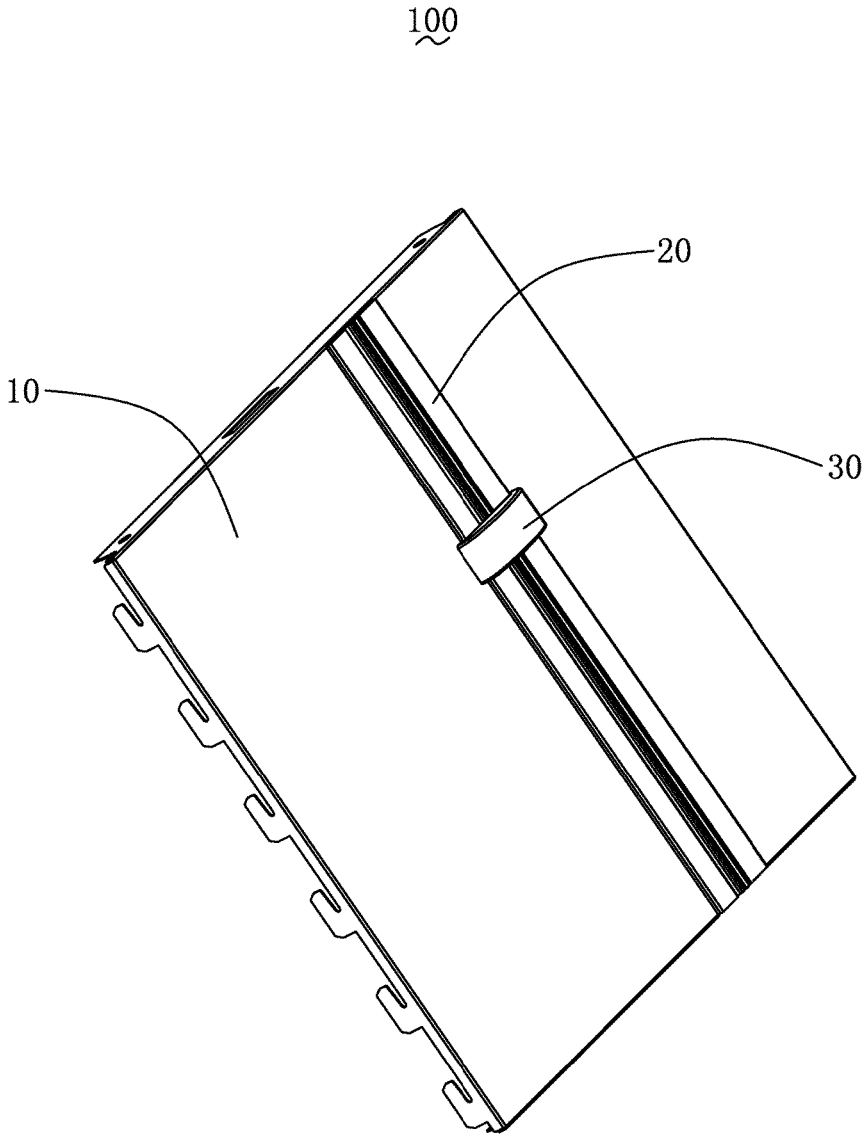



FIG. 1

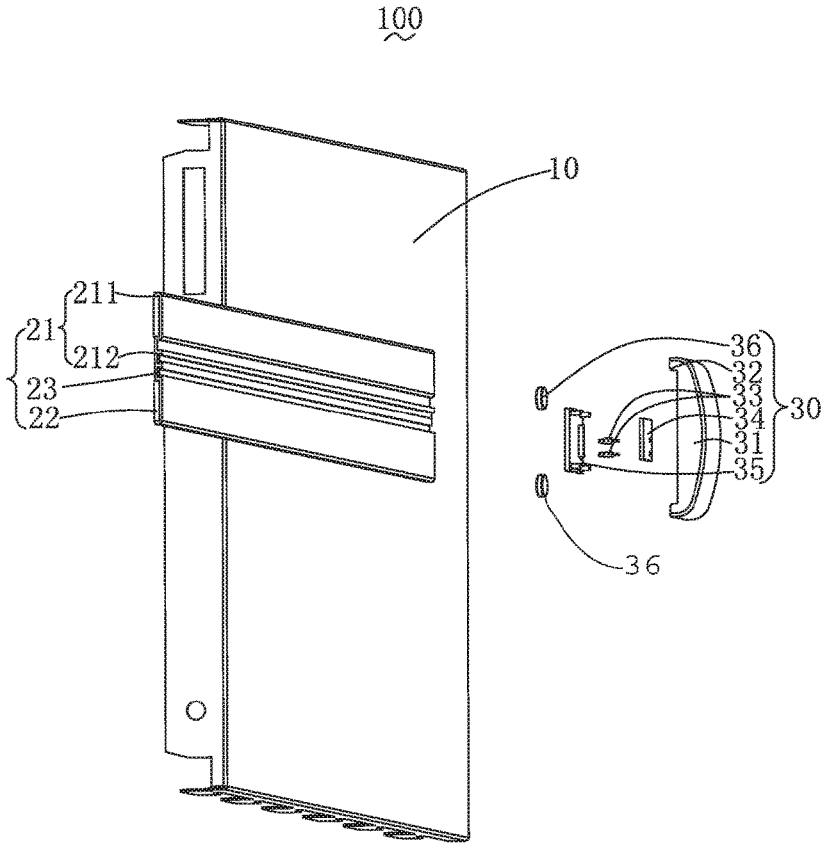



FIG. 2

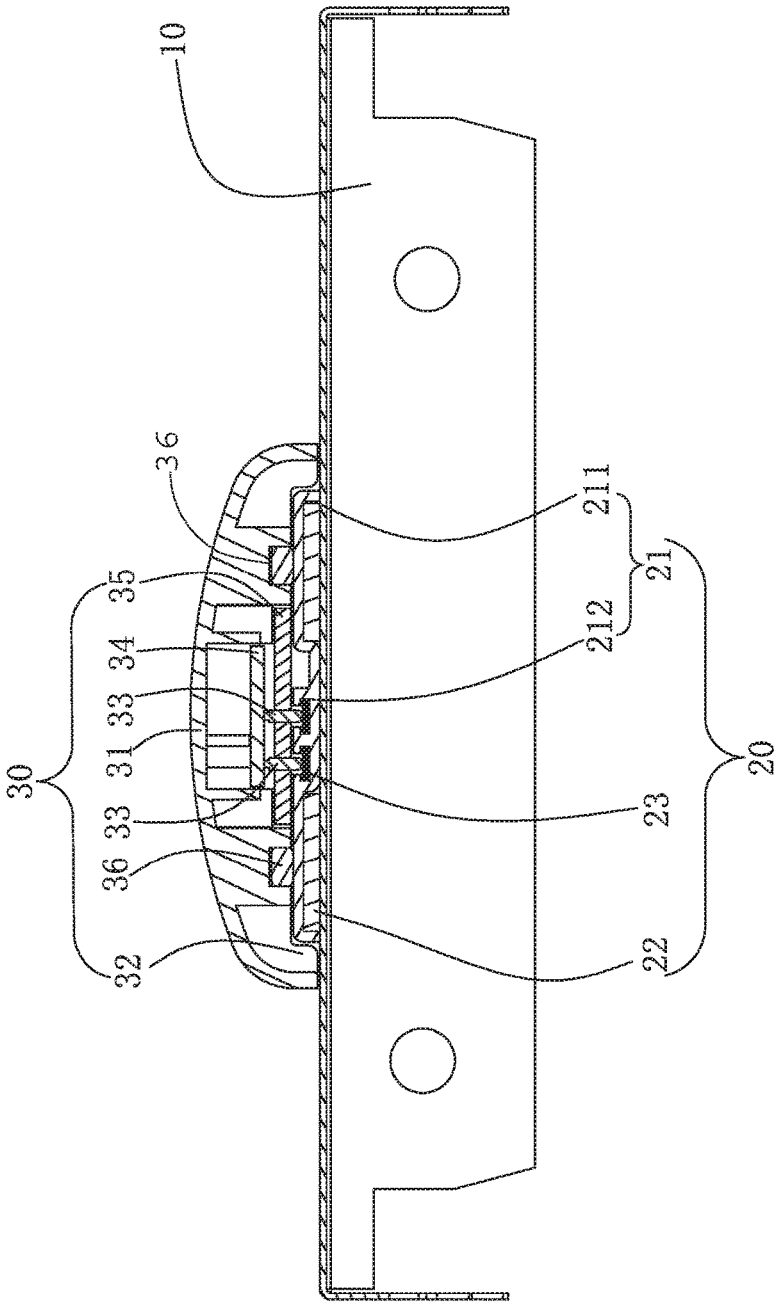



FIG. 3

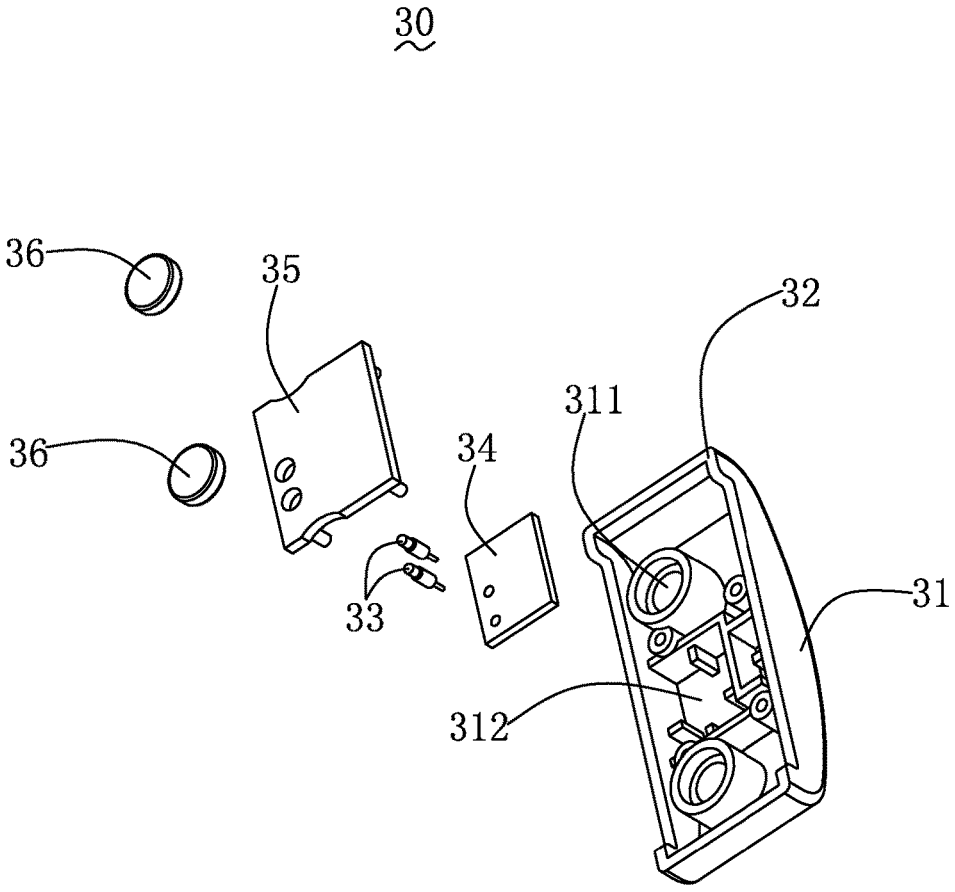



FIG. 4

# RACK SYSTEM HAVING ELECTRICAL SUPPLY

## RELATED APPLICATION

This present application claims benefit of the Chinese Application, CN201710345195.7, filed on May 16, 2017.

## BACKGROUND

### 1. Technical Field

The present application relates to a shelving equipments, and more particularly to a rack system having an electrical supply.

### 2. Description of the Related Art

The rack system is widely used, such as in shopping malls, logistics warehouses, factory warehouses, and so on, and is provided to place some goods or display some items. The lighting is necessary in the rack system, especially in the use of the shelve in the store, the lighting requirements are particularly high, such as saving space, security, easy assembly, beauty, and so on.

In the prior art, the wires of the electrical supply of the rack system generally first passes through the hollow shelve rail of the rack system, and extends out from the shelve rail, and then, it are arranged along carrier elements to supply electric for the lighting. However, when the entire rack system has been assembled and placed in the mall or supermarket, if you want to set the electrical supply, it will be very troublesome as it is difficult to disassemble the entire shelf and need to arrange the wires. As a result, it costs plurality of manpower hours.

Therefore, it is necessary to provide a rack system having an electrical supply which makes it possible to solve the above problem.

## BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the embodiments can be better understood with references to the following drawings. The components in the drawings are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the embodiments. Moreover, in the drawings, like reference numerals designate corresponding parts throughout two views.

FIG. **1** is an isometric view of a rack system having an electrical supply according to an embodiment.

FIG. **2** is an explored view of the rack system having the electrical supply of FIG. **1**.

FIG. **3** is a cross sectional view of the rack system having the electrical supply FIG. **1**.

FIG. **4** is an explored view of a supplier of the rack system having the electrical supply of FIG. **1**.

## DETAILED DESCRIPTION

The present application is illustrated by way of example and not by way of limitation in the figures of the accompanying drawings. It should be noted that references to "an" or "one" embodiment in this application are not necessarily to the same embodiment, and such references mean at least one.

Referring to FIG. **1** to FIG. **4**, a rack system having an electrical supply **100** is shown. The rack system having the electrical supply **100** includes at least one backboard **10**, a bus bar **20** mounted on the backboard **10**, and at least one supplier **30** arranged on the bus bar **20**. As is well known, the rack system having the electrical supply **100** may include other modules, such as shelves rails, carrier elements, angle brackets, and so on, and wires electrically connecting the bus bar **20** with main powers, and wires electrically connecting the supplier **30** to the lightings. These modules are well known by a person skilled in the art, and no need to explain in detail.

The backboard **10** may be typically a flat plate and made of metal material, such as steel, and is inserted into the shelves rails for isolating different shelf spaces. The backboard **10** has a same configuration with that in the existing supermarket or the shopping mall. Therefore, it is no need to describe in detail.

The bus bar **20** includes a track body **21**, two magnetic strips **22** provided on the track body **21**, and two current conductors **23** spaced apart from each other and disposed on the trace body **21**. In order to prevent electric leakage, the track body **21** is made of insulating material, such as plastic. The track body **21** may be arranged along the vertical direction of the shelves rails so that the lamps provided on a plurality of the carrier elements can be powered. In a cross section perpendicular to the extending direction of the track body **21**, the track body **21** includes two magnetic strip receiving grooves **211** spaced apart from each other, and two conductor receiving grooves **212** spaced apart from each other and disposed between the two magnetic strip receiving grooves **211**. A width and a depth of the magnetic strip receiving grooves **211** are equal to a width and a thickness of the magnetic strip **22**. Each of the two conductor receiving grooves **212** includes two L-shaped side walls so that one of the two current conductors **23** can be inserted into the two L-shaded side walls therebetween. The magnetic strips **22** may be made of soft magnetic material so as to be suitably deformed during installation. The magnetic strips **22** are attached to the magnetic strip receiving groove **211** via a method of adhering by glue, and so on. The bus bar **20** can be directly attracted onto the backboard **10** by the magnetic strips **22**, and so, the installation of the bus bar **20** can be completed. The two current conductors **23** are inserted in the two conductor receiving grooves **212** respectively and are engaged with the current conductors **23** by the L-shaped side walls of the conductor receiving grooves **212** so as to fix the current conductors **23** therein. In order to make the thickness of the bus bar **20** become thinner, the center lines of the magnetic strips **22** overlap that of the current conductors **23** along the arrangement direction thereof so as to reduce the whole thickness of the bus bar **20**. The magnetic strip receiving grooves **211** and the conductor receiving grooves **212** are arranged on two opposite side walls of the track body **21**, respectively

The supplier **30** includes a main body **31**, two holding portions **32** extending from the main body **31**, two resilient contactors **33** disposed in the main body **31** and spaced apart from each other, a circuit board **34** mounted in the main body **31**, a cover **35** arranged on the circuit board **34**, two magnetic columns **36** disposed in the main body **31** and arranged on both sides of the two resilient contactors **33**. The main body **31** is provided with two blind holes **311** for receiving the two magnetic columns **36** respectively and a receiving chamber **312** disposed between the two blind holes **311**. The main body **31** may be injected from a plastic material and is integrally formed with the blind holes **311** and the receiving chamber **312**. The receiving chamber **312** is configured for disposing the circuit board **34** and the two

resilient contactors **33**. The two holding portions **32** may also be molded together with the main body **31** and extend towards the bus bar **30** and engage with the two side walls of the bus bar **20** which are perpendicular to the arrangement direction of the magnetic strips **22** and the current conductors **23**. Therefore, the supplier **30** can be moved along the extending direction of the bus bar **20**. The resilient contactors **33** are prior art known to those skilled in the art and will be briefly described herein. The resilient contactor **33** includes a sleeve, a spring disposed in the sleeve, and a circular or stepped contactor extending beyond one end of the sleeve. The contactor can be secured in the sleeve by compressing the sleeve port to form the resilient contactor **33**. The circuit board **34** is prior art known to those skilled in the art and is configured for electrically connecting various electronic components, such as triodes, diodes, resistors, and the like. The resilient contactors **33** may be fixed onto the circuit board **34** and electrically connected to the outer wires. The method of fixing the resilient contactors **33** may be a soldering. The cover **35** is arranged onto the circuit board **34** to protect the circuit board **34**. It will be appreciated that the cover **35** is provided with two through holes therein for the resilient contactors **33**. The magnetic columns **36** may be fixed in the two blind holes **311** respectively by interference fit.

In use, the bus bar **20** is firstly attached to the appropriated position of the backboard **10** by the magnetic strips **22**, and the supplier **30** is arranged onto the bus bar **20**. The two magnetic columns **36** are attached onto the two magnetic strips **22** respectively, and the two resilient contactors **33** are respectively abutted against the two magnetic strips **22** when the supplier **30** is mounted on the bus bar **20** so that the two resilient contactors **33** are electrically connected to the current conductors **33**, respectively. In addition, when the resilient contactors **33** are electrically connected to the current conductors **23**, the resilient contactor **33** will pass through the gap formed between the two L-shaped side walls of the conductor receiving grooves **212**.

Compared with the prior art, the rack system having the electrical supply **100** provided by the present invention can make the bus bar **20** thinner by using the structure thereof, for example, a thickness of 2 mm to 3 mm. Therefore, the bus bar **20** can directly pass from the tolerance gap between the backboard **10** and the carrier elements without disassembling the whole rack system, thereby completing the installation of the bus bar **20**. And then, the supplier **30** can be directly placed onto the bus bar **20** so as to achieve electrically connection. As a result, it is easy to install the rack system having the electrical supply so as to save cost and time.

While the disclosure has been described by way of example and in terms of exemplary embodiment, it is to be understood that the disclosure is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements (as would be apparent to those skilled in the art). Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:

**1**. A rack system having an electrical supply, comprising:
- at least one backboard;
- a track body with a plurality of grooves attached to the backboard;
- two magnetic strips disposed on two grooves on the track body;
- two current conductors disposed in two separate grooves between the two magnetic strips; and
- a supplier attached on top of the track body, the supplier comprising
  - two contactors spaced apart from each other, and
  - two magnetic columns arranged both sides of the contactors and attached onto the two magnetic strips,
  - wherein each contactor abuts against one of the magnetic strips so that the two contactors are electrically connected to the current conductor.

**2**. The rack system having the electrical supply as claimed in claim **1**, wherein the track body is made of insulation material.

**3**. The rack system having the electrical supply as claimed in claim **1**, wherein the supplier further comprises a main body, and two holding portions extending from the main body, the two holding portions are engaged with two side walls of the track body which are perpendicular to a longitudinal direction of the magnetic strips and the current conductors.

**4**. The rack system having the electrical supply as claimed in claim **3**, wherein the main body comprises two blind holes, each blind hole receives a magnetic column, and a receiving chamber disposed between the two blind holes, the receiving chamber is configured to receive the contactors.

**5**. The rack system having the electrical supply as claimed in claim **4**, wherein the supply further comprises a circuit board disposed inside the receiving chamber, and a cover covers the circuit board disposed inside the receiving chamber, the contactor is welded to the circuit board and protrudes out of the cover.

**6**. The rack system having the electrical supply as claimed in claim **1**, wherein the two magnetic strips are made of soft magnetic material.

**7**. The rack system having the electrical supply as claimed in claim **1**, wherein the backboard is made of metal material, the track body is directly attached onto the backboard through the two magnetic strips.

**8**. The rack system having the electrical supply as claimed in claim **1**, wherein the two grooves receiving the two conductors have an L-shaped cross section.

**9**. The rack system having the electrical supply as claimed in claim **8**, wherein each contactor passes through a gap in the L-shaped cross section and electrically connects to the current conductor.

**10**. The rack system having the electrical supply as claimed in claim **1**, wherein the center line of the magnetic strip is overlapped with that of the current conductor along the arrangement direction of the magnetic strip and the current conductor.

**11**. A rack system comprising:
- a backboard;
- a bus bar mounted on the backboard, the bus bar having a plurality of conductors and a plurality of magnetic strips; and
- a supplier attached to the bus bar, the supplier having a receiving chamber, a cover removably attached to the receiving chamber, and an electric circuit with a plurality of holes placed inside the receiving chamber; and
- a plurality of resilient contactors electrically attached to the electric circuit through the plurality of holes and connecting the electric circuit to the plurality of conductors, and a plurality of magnetic columns,
- wherein the bus bar is mounted to the backboard through the plurality of magnetic strips and the supplier is attached to the bus bar through the plurality of magnetic columns.

**12**. The rack system of claim **11**, wherein the bus bar further comprises a track body, the track body has a first

plurality of grooves for receiving the plurality of conductors and a second plurality of grooves for receiving the plurality of magnetic strips, the first plurality of grooves and the second plurality of grooves face opposite sides.

**13**. The rack system of claim **12**, wherein the first plurality of grooves have a L-shape cross section.

**14**. The rack system of claim **11**, wherein the supplier further comprises a plurality of blind holes, the plurality of blind holes receive the plurality of magnetic columns.

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